IPC-616

14-slot Fault-resilient
IPC Chassis

User's Manual

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Acknowledgments

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Chapter 1 General Information

1.1 Introduction

The IPC-616 is a PC/ATX-compatible computer designed for industrial applications. This rugged, all-steel chassis meets the EIA RS-310C 19" rackmount standard. The unit includes a 14-slot PC-bus compatible passive backplane, a high-efficiency 300-watt switching power supply, and hot-swap cooling fans, all in a single compact chassis.

A fault detection and alarm notification system is provided in the IPC-616. It monitors its own hardware status, including temperature, cooling fans, and power.

The IPC-616 withstands shock, vibration, dust, and a wide range of operating temperatures in harsh industrial environments. The chassis is positively pressurized by two filtered hot-swap cooling fans to exclude dust and dirt. A lockable door protects drives and switches from tampering and foreign particles.

1.2 Specifications

General

- **Construction**: Heavy-duty steel
- **Disk drive capacity**: Three half-height and one 3.5" front-accessible disk drives. Also one internal 3.5" HDD
- **Cooling system**: Two 53 CFM speed-sensored hot-swap cooling fans with air filter
- **Controls**: System reset, power on/off, and alarm reset all on the front panel
- **Status indicators**: Single color LEDs (green) for +3.3 V, +5 V, +12 V, -5 V, -12 V and HDD activity. Bicolor LEDs (green/red) for power failure, fan failure and overheating
- **Speaker**: One 8 ohm speaker on alarm board
- **Dimensions (W x D x H)**: 482 x 478 x 177 mm (19" x 18.8" x 7")
- **Weight**: 16 kg (35.2 lb)
- **Paint color:** Black (2U, 2X, fabric texture) for front bezel only, nickelplating for rest of chassis

Passive backplanes

Model Name	Slots per Segment (ISA / PCI / CPU)	Segment
PCA-6114P4-B	9 ISA / 4 PCI / 1 CPU	Single
PCA-6114P7	6 ISA / 7 PCI / 1 CPU	Single
PCA-6114P10	3 ISA / 10 PCI / 1 CPU	Single
PCA-6113P4R	8 ISA / 4 PCI / 1 CPU	Single

Power supplies

PS-300ATX

- **Output rating**: 300 watts (max.)
- **Input voltage**: 90 ~ 130 V_{AC} or 180 ~ 265 V_{AC} @ 47 ~ 63 Hz, switchable
- **Output voltages**:
  +5 V @ 30 A, +12 V @ 13 A, -5 V @ 0.5 A, -12 V @ 0.8 A, +3.3 V @ 26 A, +5 VSB @ 2 A
- **Minimum load:** +5 V @ 1 A, +12 V @ 0.2 A
- **MTBF**: 100,000 hours @ 25° C, full load
- **Safety**: UL, CSA, CE, NOROIC CENELEC, CB approved
- **EMI**: FCC, VDE, CISPR 22

PS-310-DC48

- **Output rating**: 310 watts (max.)
- **Input voltage**: -38 ~ -58 V_{DC}
- **Output voltages**: +5 V @ 25 A, +12 V @ 10 A, -5 V @ 1 A, -12 V @ 5 A
- **Minimum load:** +5 V @ 3 A, +12 V @ 1 A
- **MTBF**: 100,000 hours @ 25° C
- **Safety**: UL approved
- **EMI**: CE compliant

Installation notes

The IPC-616 is designed to permit the connection of the earthed conductor of the DC supply circuit to the earthing conductor of the IPC-616's chassis.

If this connection is made, make sure that:

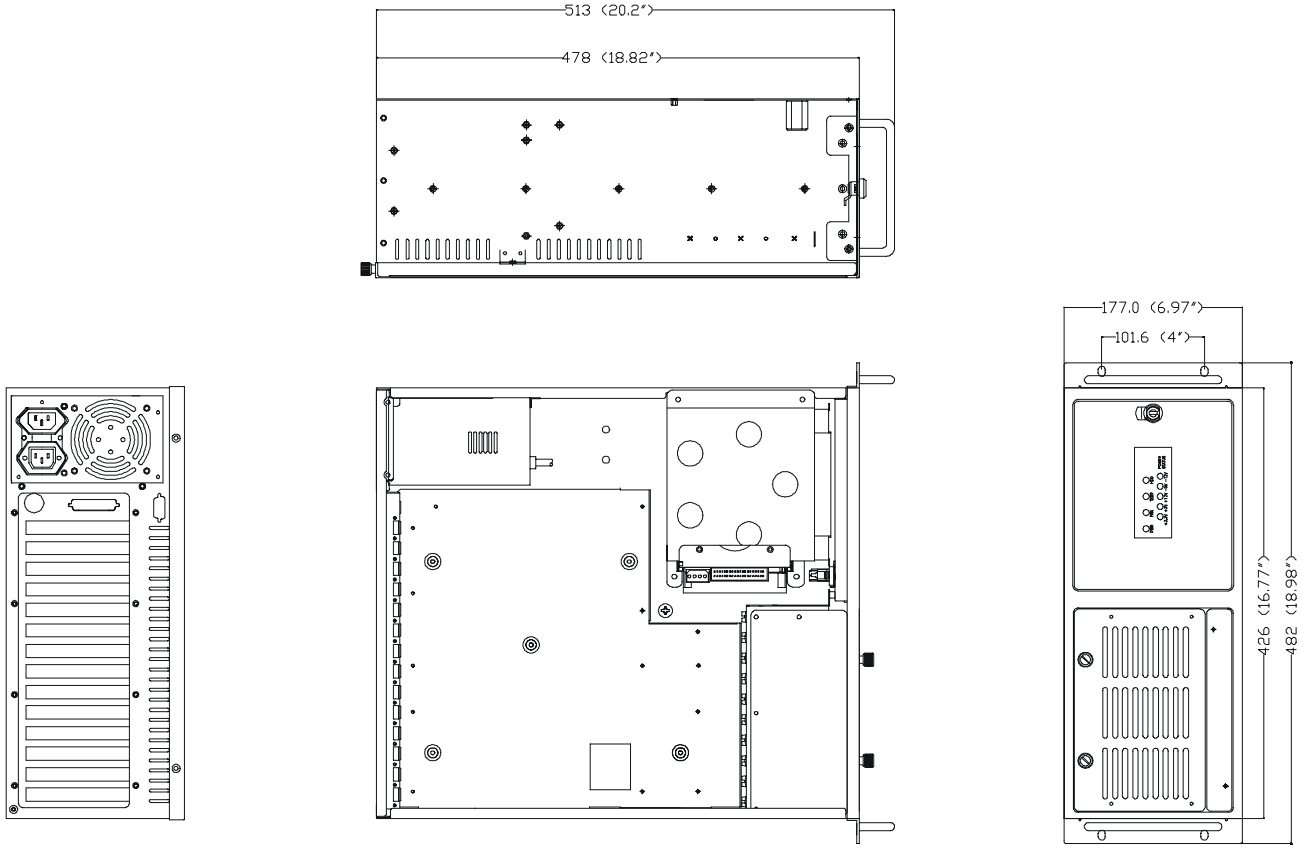
1. The IPC-616 is connected directly to the DC supply system earthing electrode conductor, or to a bonding jumper from an earthing terminal bar or bus to which the DC supply system earthing electrode conductor is connected.
2. The IPC-616 is located not only in the same immediate area (such as adjacent cabinets) as any other equipment that has a connection between the earthed conductor of the same DC supply circuit.and the earthing conductor, but also in the same immediate area as the point of earthing of the DC system. The DC system must not be earthed elsewhere.
3. The DC supply source is located within the same premises as the IPC-616.
4. No switching or disconnecting device is installed in the earthed circuit conductor between the DC source and the point of connection of the earthing electrode conductor.

Warning: Due to the high wattage of the IPC-616, users must not remove the top cover of the chassis. If users need to install or remove any device in the IPC-616, they should consult qualified technical personnel.

Environmental specifications

- **Operating temperature**: 0 ~ 40° C (32 ~ 104° F)
- **Relative humidity**: 10 ~ 95% @ 40°C, non-condensing
- **Vibration (operating)**: 5 ~ 500 Hz, 1 G rms for random vibration
- **Shock (operating)**: 10 G acceleration peak (11 msec. duration)
- **Safety**: UL, C-UL approved
- **CE compliant**

1.3 Dimensions



Unit: mm (inches)

Chapter 2 System Setup

Setting up your IPC-616 requires only a screwdriver and a small amount of time. Before you begin, you should also gather together all of the cards you plan to install, as well as the keyboard you plan to use.

A lockable door is located on the chassis front cover, providing access to the control panel. This offers protection and security against damage and unauthorized access. The control panel functions include power on/off and reset switches to assist in monitoring system status. When the system detects a failure (concerning power, overheating or fans), these LED indicators will change color from green to red. There is a ground point (earthing point) located on the bottom right hand corner of the rear panel. This provides an earth for the whole system, and is attached via a screw.

Warning: *Disconnect all power from the chassis before you install the CPU cards. Unplug the power cord from the wall. Do not merely turn off the power switch. If you are not sure what to do, take the job to an experienced professional.*

2.1 Removing the Cover

Removing the cover to conduct maintenance is easy. No tools are required. Simply unscrew the two thumbscrews near the rear of the chassis. See Figures 2-1:

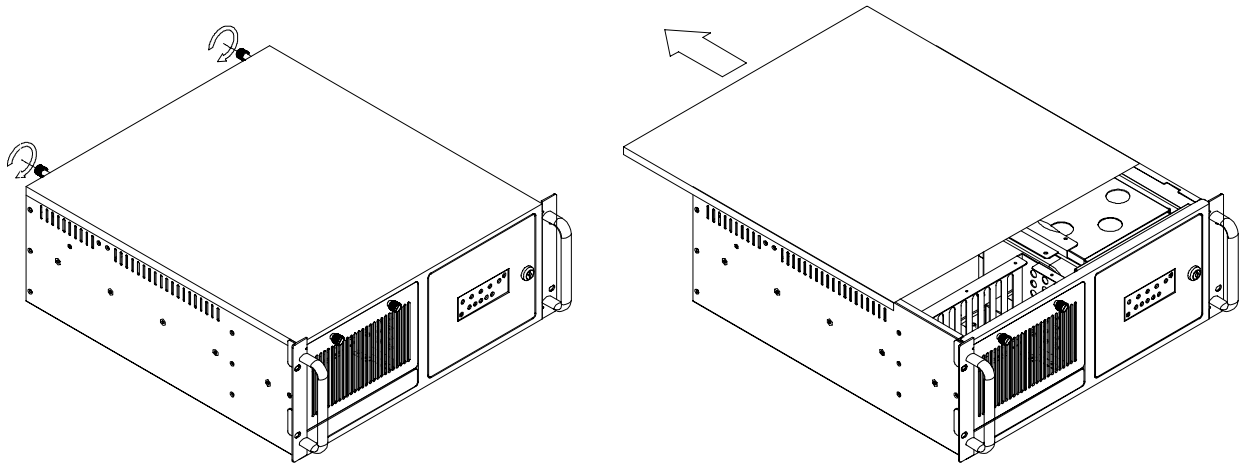


Figure 2-1: Removing the cover

2.2 Removing the Handles

The handles and mounting brackets for the front panel can be removed as follows:

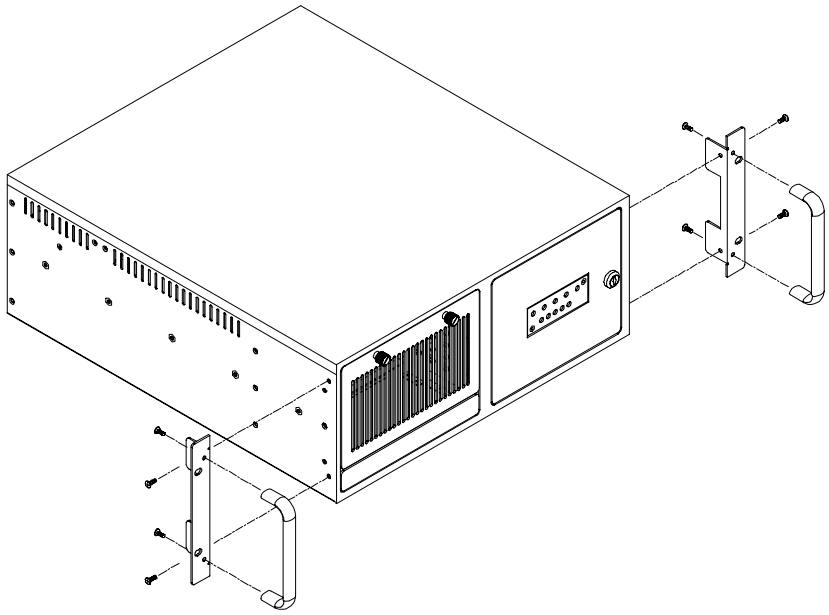


Figure 2-2: Removing the handles

2.3 Adding Your Disk Drives

1. After removing the cover, you will see four screws near the drive bay. Remove these screws. Lift the drive bay free of the chassis. See Figure 2-3 below:

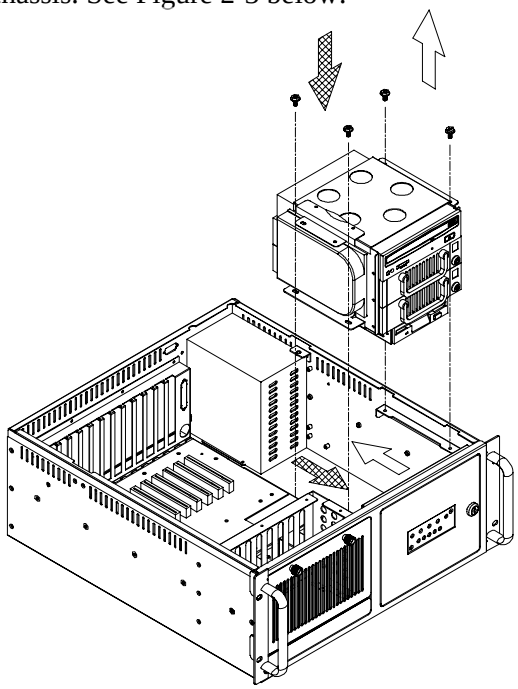


Figure 2-3: Removing the screws

2. Remove the front cover of the drive bay, and insert the drives into their proper locations in the drive bay. See Figure 2-4 below:

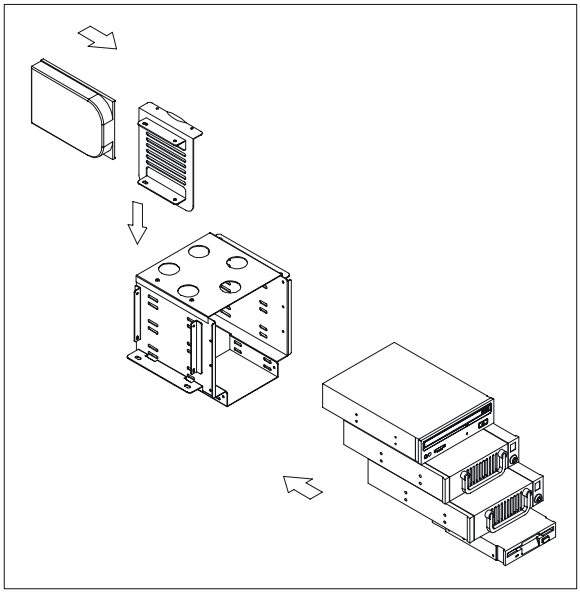


Figure 2-4: Assembling the disk drive bay

2.4 The Hold-down Clamp

The IPC-616 uses a hold-down clamp to ensure that the plug-in cards are positioned securely. It also offers protection against shock and vibration. To install your cards into the passive backplane, proceed as follows:

1. Detach the hold-down clamp by removing the two screws located at each end, and lifting it off the chassis. See Figure 2-5 below.
2. Insert the rubber buffers (provided in your kit) into the hold-down clamp. These buffers offer the plug-in cards two levels of protection against vibration. See Figure 2-6 below:

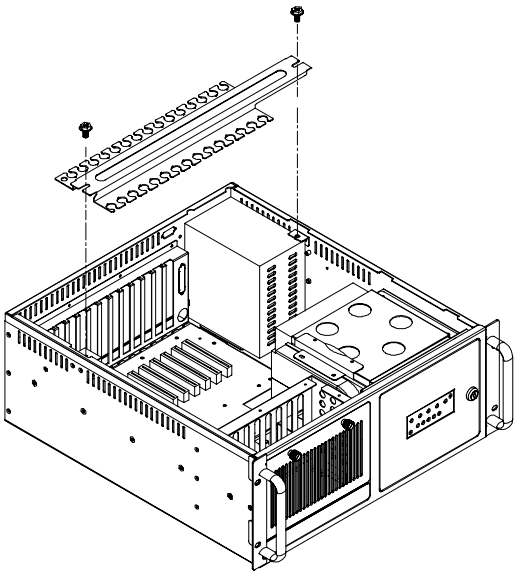


Figure 2-5: The hold-down clamp

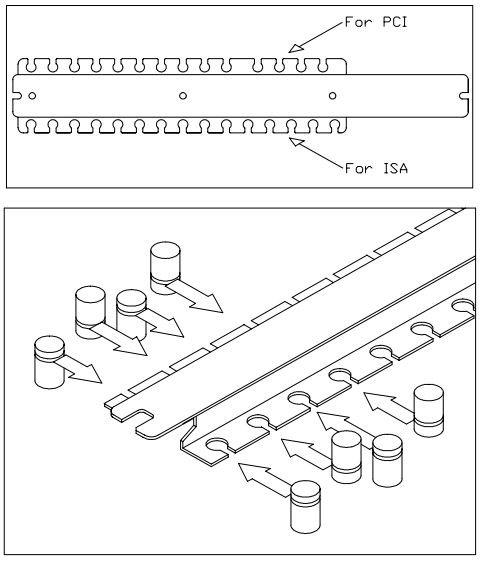


Figure 2-6: Inserting the rubber buffers

2.5 Replacing the Filter

The filter is located on the left side of the front panel. If the IPC-616 is under continuous use, the filter should be removed about once a month. To replace the filter, remove the thumbscrew to open out the front panel. Refer to Figures 2-7. Take out the old filter and slide the new one into place. Refer to Figure 2-8. Then close and lock the lockable door.

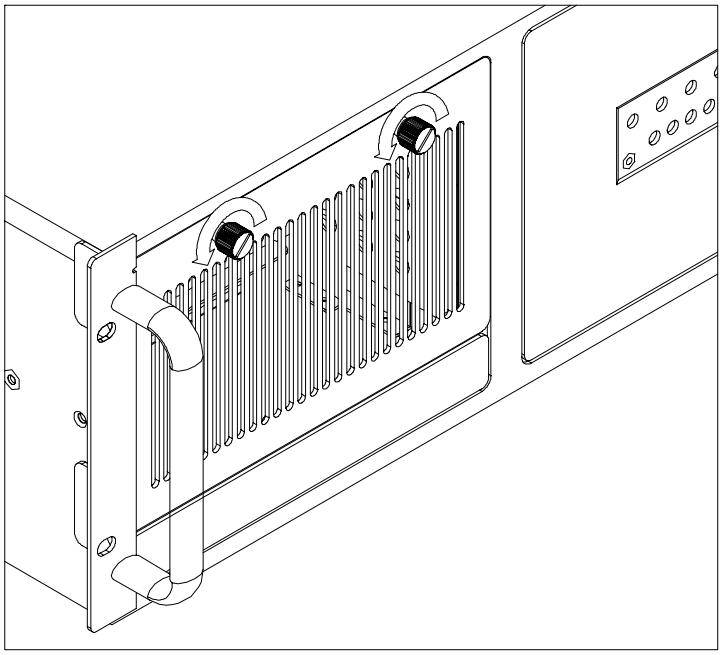


Figure 2-7: Removing the thumbscrews

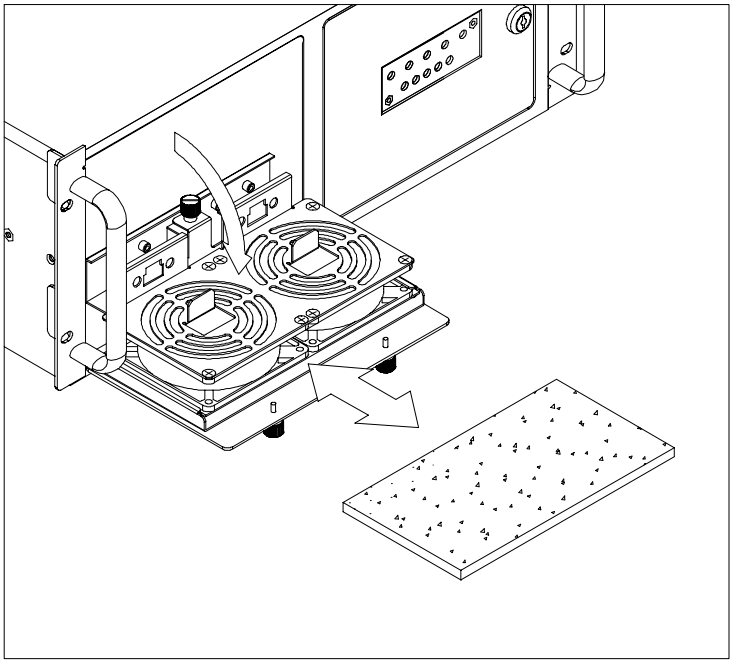
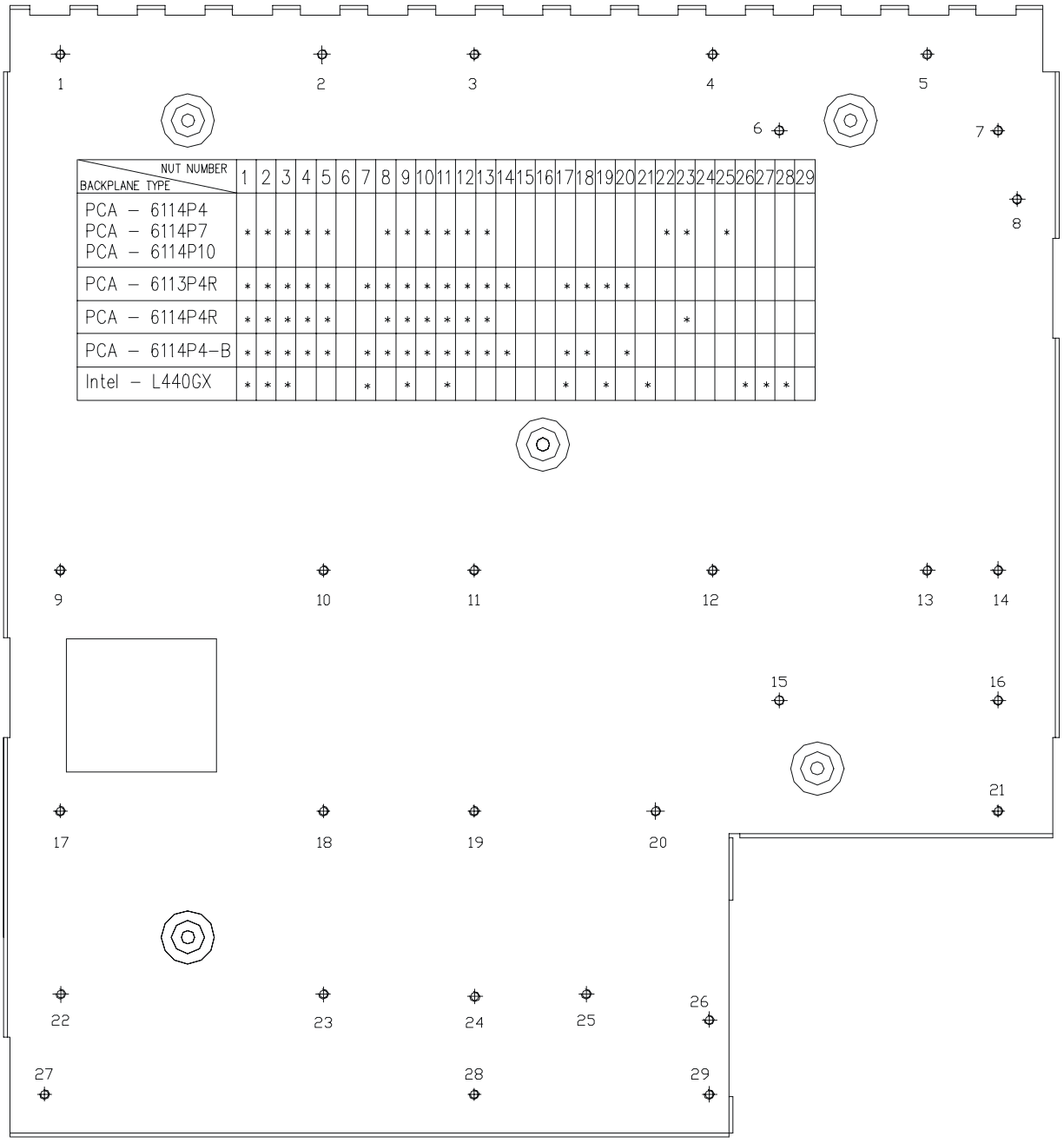


Figure 2-8: Replacing the filter

2.6 Attaching the Backplane to the Backplane Bracket

The backplane bracket has 29 attaching holes (see Figure 2-9). Any of six backplanes or the Intel® L440GX motherboard may be attached to backplane bracket. A table on the bracket shows which holes should be used for each of the backplane/motherboard options.



BACKPLANE TYPE \ NUT NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
PCA – 6114P4 PCA – 6114P7 PCA – 6114P10	*	*	*	*	*			*	*	*	*	*	*									*	*		*				
PCA – 6113P4R	*	*	*	*	*		*	*	*	*	*	*	*	*			*	*	*	*									
PCA – 6114P4R	*	*	*	*	*			*	*	*	*	*	*										*						
PCA – 6114P4–B	*	*	*	*	*		*	*	*	*	*	*	*	*			*	*		*									
Intel – L440GX	*	*	*				*		*		*						*		*		*					*	*	*	

Figure 2-9: Backplane bracket

Chapter 3 Fault-resilient Functions

3.1 Introduction

A fault-resilient IPC has a fault detection and alarm notification system. The IPC-616 monitors its own status. See Figures 3-1 and 3-2 below. When a malfunction occurs, the unit alerts users of the need for maintenance.

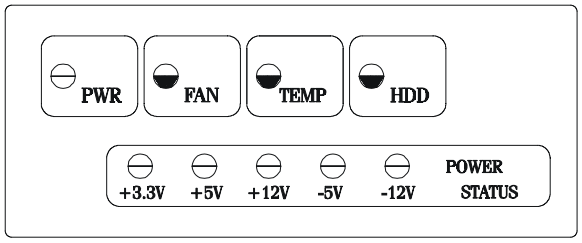


Figure 3-1: LED indicators

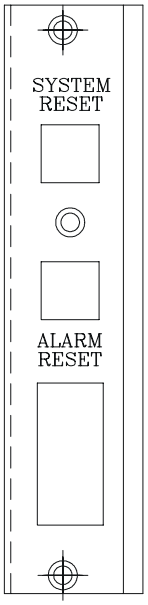


Figure 3-2: Controls

3.2 Fault Detection and Alarm Notification

The IPC-616 monitors system hardware for power failure, fan failure and overheating within the chassis. Fault conditions are:

Power failure: Either the backplane power source (+5 V, +12 V, +3.3 V, -5 V, -12 V) or redundant power module fails

Fan failure: Either of the two cooling fans fails

Overheating: The chassis' internal temperature has reached or exceeds the user's preset maximum safe temperature

Once a problem is detected, an audible alarm activates and an LED alarm indicator (located on the front door) changes color from green to red.

3.3 Visible and Audible Alarms

The IPC-616 provides quick fault identification with nine front panel LED indicators displaying the system's status as follows:

Power failure: If either the backplane power source (+5 V, +12 V, +3.3 V, -5 V, -12 V) or redundant power module fails, the "PWR" LED changes from green to red. You should immediately replace the malfunctioning power module with a good one.

Fan failure: If either of the two cooling fans fails, an alarm LED changes color from green to red. You should immediately replace the malfunctioning cooling fan module with a good one (see Figure 3-3 below).

Overheating: If the chassis' interior temperature reaches the user's preset maximum safe temperature (which will be either 50°, 55°, 65°, or 70° C), an alarm LED changes color from green to red. The LED remains red until the temperature returns below 50° C.

A speaker is activated at the start of a malfunction, and it will sound until the alarm reset button is pressed. However, the LED indicator will stay red until the fault condition is resolved.

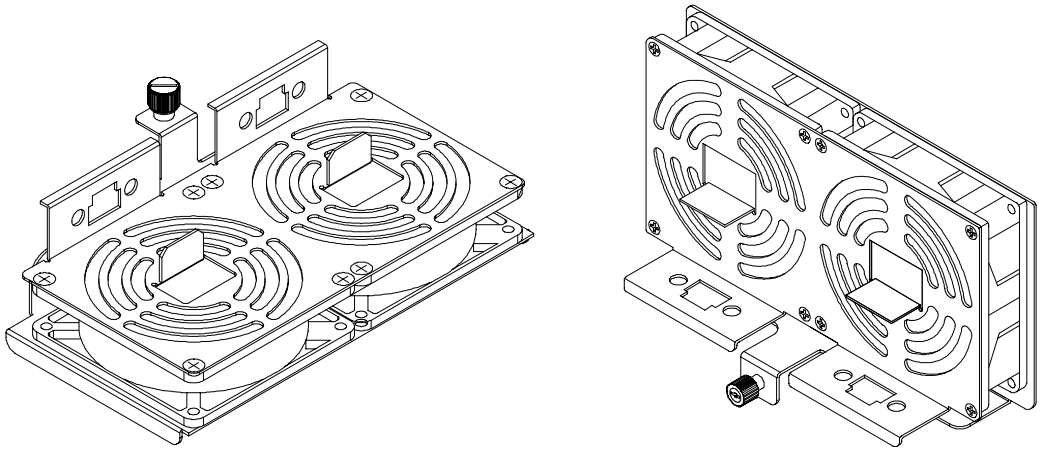


Figure 3-3: Cooling fan module

3.4 Overheating Sensor

There is a small PC board called "Over Temp" installed on the left interior of the chassis. It monitors the chassis' internal temperature.

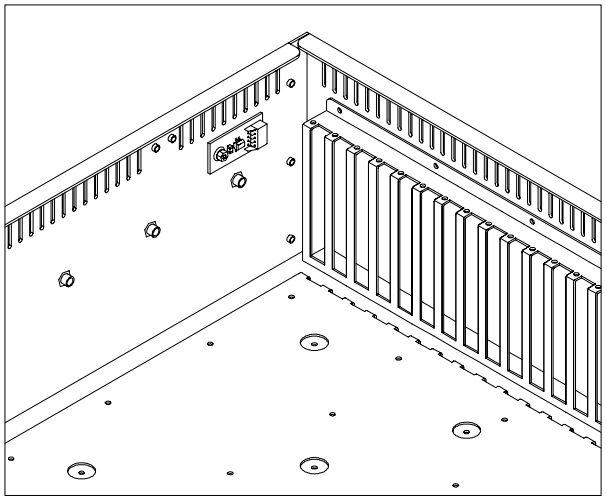
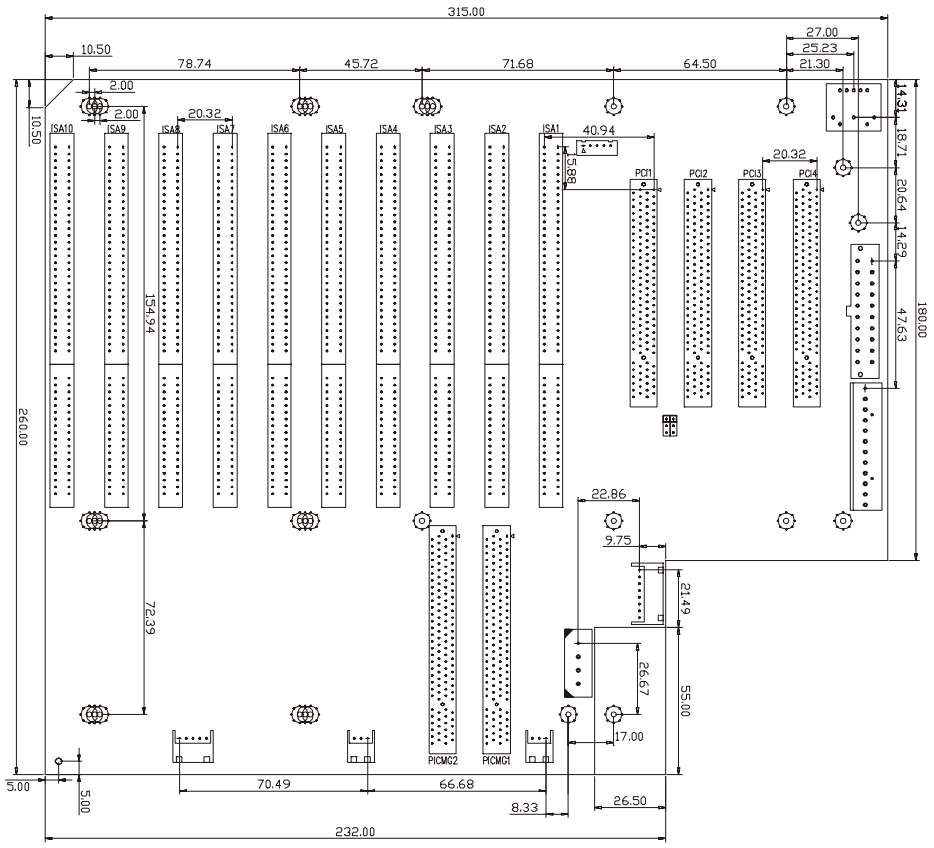


Figure 3-4: Overheating sensor on chassis

Appendix A Passive Backplanes

A.1 PCA-6114P4-B: 9 ISA / 4 PCI / 1 PICMG-slot Backplane

Dimensions: 260 x 315 mm



Unit: mm

1. CONNECTORS

CONNECTOR	DESCRIPTION
ISA2~ISA3	PICMG connector
ISA1,ISA4~ISA10	16-bit ISA-bus connectors
PCI1~PCI4	32-bit PCI-bus connectors
KB1(KB-IN)	To CPU card K/B connector
KB2(KB-OUT)	5-pin external K/B connector
KB3	External K/B connector
P1	PS/2 power connector
P2	For +5V and +12V power connector
P3	Big 4-pin power connector
CN1	To CPU card for ATX power signal
CN2	Alarm board 8-pin power connector
ATX1	ATX power connector
J1	PCI1 IDSEL
J2	PCI2 IDSEL

CN1	
1	5VSB
2	GND
3	PS-ON
Default: Pins 2-3 closed	

J1	
1-2 closed	PCI1 IDESL=AD31 (Default)
2-3 closed	PCI1 IDSEL=AD27

J2	
1-2 closed	PCI2 IDSEL=AD30 (Default)
2-3 closed	PCI2 IDSEL=AD26

2. PIN ASSIGNMENTS

CN2	
PIN	NAME
1	+12V
2	-12V
3	+3.3V
4	+5V
5	-5V
6	GND
7	GND
8	5VSB

P1	
PIN	NAME
1	NC
2	+5V
3	+12V
4	-12V
5	GND
6	GND
7	GND
8	GND
9	-5V
10	+5V
11	+5V
12	+5V

P2	
PIN	NAME
1	+5V
2	GND
3	+12V

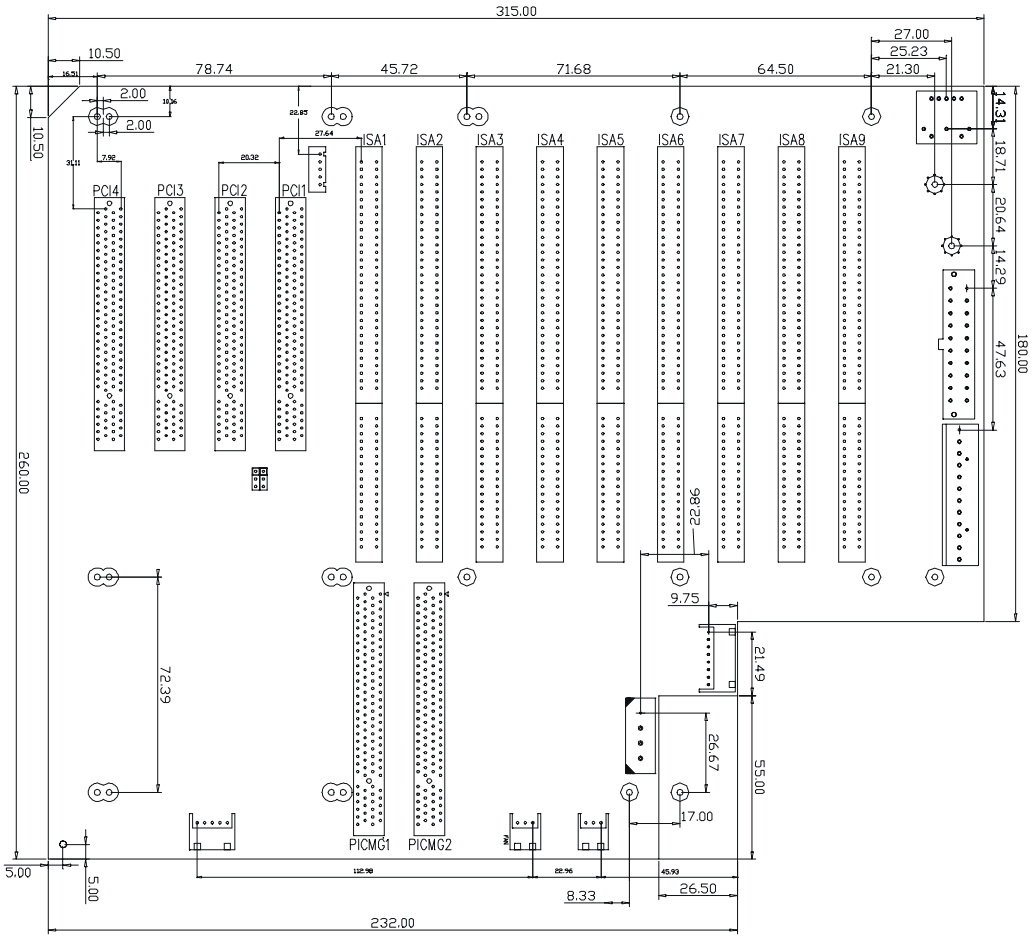
P3	
PIN	NAME
1	+12V
2	GND
3	GND
4	+5V

ATX1			
PIN	NAME	PIN	NAME
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS-ON
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	NC	18	-5V
9	5VSB	19	+5V
10	+12V	20	+5V

KB1~KB3	
PIN	NAME
1	KBCLK
2	KBDATA
3	NC
4	KBGND
5	KBVCC

A.2 PCA-6113P4R: 8 ISA / 4 PCI / 1 PICMG-slot Backplane

Dimensions: 260 x 315 mm



Unit: mm

1. CONNECTORS

CONNECTOR	Description
ISA1 ~ ISA2	PICMG connector
ISA3 ~ ISA9	16-bit ISA bus connectors
PCI1 ~ PCI4	32-bit PCI bus connectors
KB1 (KB-IN)	To CPU card K/B connector
KB2 (KB-OUT)	5-pin external K/B connector
KB3	External K/B connector
P1	PS/2 power connector
P2	For +5V and +12V power connector
P3	Big 4-pin power connector
CN1	To CPU card for ATX power signal
CN2	Alarm board 8-pin power connector
ATX1	ATX power connector
J1	PCI1 IDSEL
J2	PCI2 IDSEL

CN1	
1	5VSB
2	GND
3	PS-ON
Default: Pins 2-3 closed	

J1	
1-2 closed	PCI1 IDESL=AD31 (Default)
2-3 closed	PCI1 IDSEL=AD27

J2	
1-2 closed	PCI2 IDSEL=AD30 (Default)
2-3 closed	PCI2 IDSEL=AD26

2. PIN ASSIGNMENTS

CN2	
PIN	NAME
1	+12V
2	-12V
3	+3.3V
4	+5V
5	-5V
6	GND
7	GND
8	5VSB

P1	
PIN	NAME
1	NC
2	+5V
3	+12V
4	-12V
5	GND
6	GND
7	GND
8	GND
9	-5V
10	+5V
11	+5V
12	+5V

P2	
PIN	NAME
1	+5V
2	GND
3	+12V

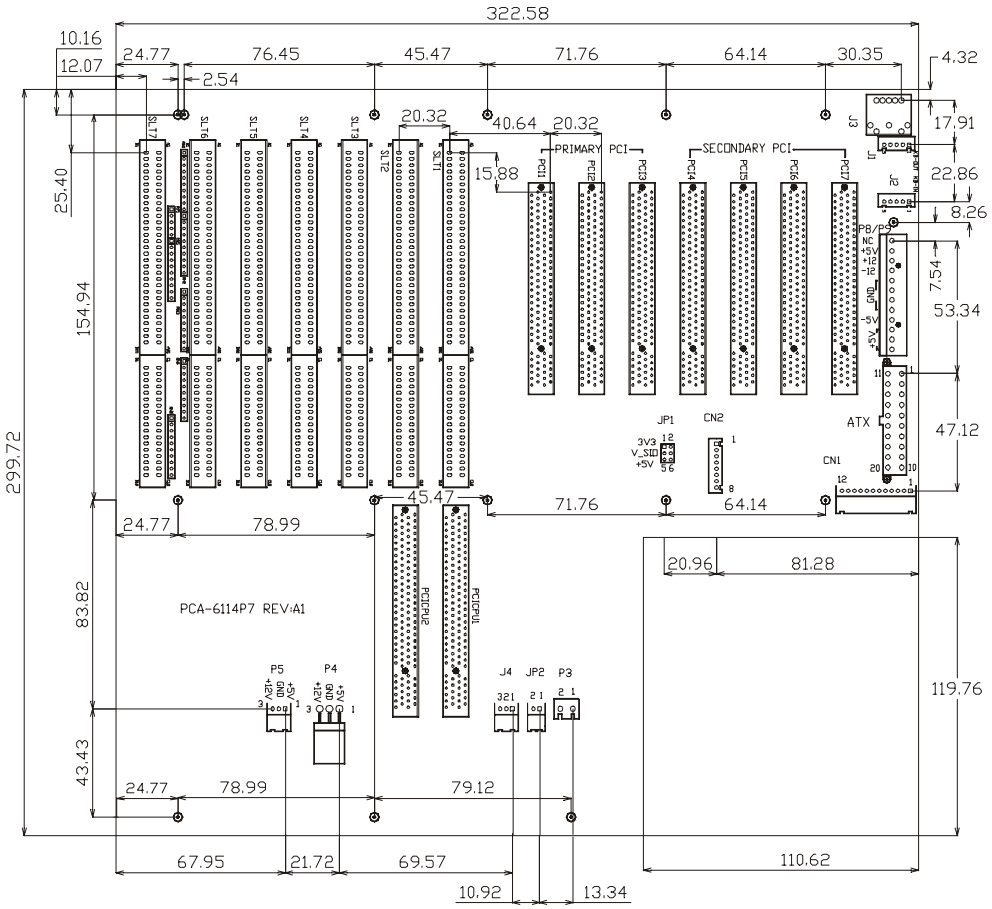
P3	
PIN	NAME
1	+12V
2	GND
3	GND
4	+5V

ATX1			
PIN	NAME	PIN	NAME
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS-ON
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	NC	18	-5V
9	5VSB	19	+5V
10	+12V	20	+5V

KB1 ~ KB3	
PIN	NAME
1	KBCLK
2	KBDATA
3	NC
4	KBGND
5	KBVCC

A.3 PCA-6114P7: 6 ISA / 7 PCI / 1 PICMG-slot Backplane

Dimensions: 300 x 323 mm



Unit: mm

1. CONNECTORS

CONNECTOR	Description
SLT1 ~ 2	PCIMG connectors
SLT3 ~ 7	16 BIT ISA BUS connectors
PCI 1 ~ 3	32 BIT PCI BUS connectors (primary)
PCI 4 ~ 7	32 BIT PCI BUS connectors (secondary)
CN1	12 Pin power (+ / -5V , + / -12V),SP,HDD,K/B,reset and PF Connector
CN2	8 Pin power (+ / - 5V , + / - 12V) , SP , HDD and PF Connector
ATX	To ATX power connector
J1(KB - OUT)	To front part K/B connector
J2 (K/B - IN)	To CPU CARD K/B connector
J3	External K/B connector
J4	To CPU CARD for ATX power signal
JP1	V - IO for secondary PCI Bus
JP2	Power ON control for ATX power supply
P3	2 - PIN +5V DC power connector
P4 ~ P5	3 - PIN +5V and +12vDC power connector
P8 / P9	TO PS / 2 power connector

JP1	
1-3,2-4 CLOSED	V_IO = +3.3V for secondary PCI Bus
✳ 3-5,4-6 CLOSED	V_IO = +5V for secondary PCI Bus

Default : ✳

JP2	
closed	ATX power supply power ON
open	ATX power supply power OFF

2. PIN ASSIGNMENTS

CN1	
PIN	NAME
1	+12V
2	-12V
3	SP
4	+5V
5	KBDLOCK
6	KBDDATA
7	KBDCLK
8	-5V
9	GND
10	RESET
11	HDD
12	+3.3V

CN2	
PIN	NAME
1	SP
2	+5V
3	KBDLOCK
4	GND
5	GND
6	RESET
7	HDD
8	NC

P4 ~ P5	
PIN	NAME
1	+5V
2	GND
3	+12V

P8/P9	
PIN	NAME
1	NC
2	+5V
3	+12V
4	-12V
5	GND
6	GND
7	GND
8	GND
9	-5V
10	+5V
11	+5V
12	+5V

P3	
PIN	NAME
1	+5V
2	GND

P11	
1	+3.3V
2	+3.3V
3	+3.3V
4	GND
5	GND
6	GND

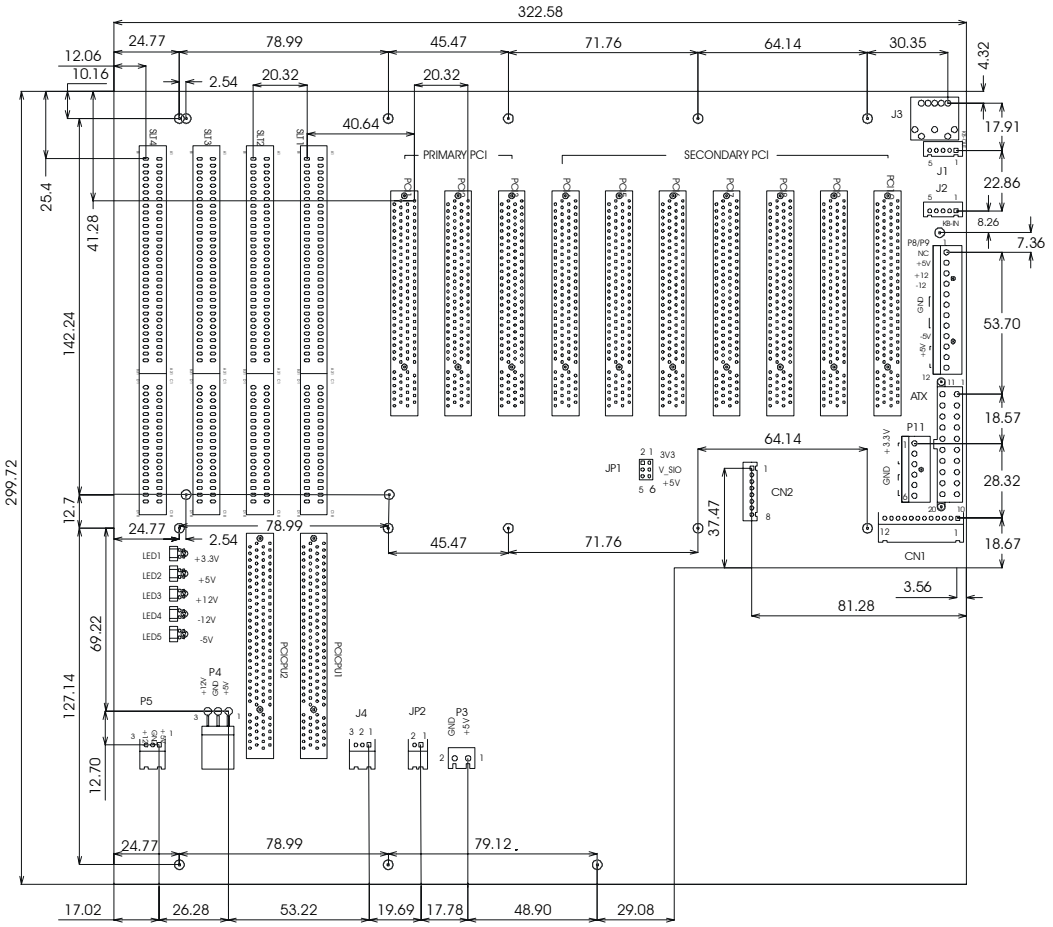
J1~ 3	
PIN	NAME
1	KBDCLK
2	KBDDATA
3	NC
4	GND
5	+ 5V

J4	
PIN	NAME
1	5V STB
2	GND
3	PS-ON

ATX			
PIN	NAME	PIN	NAME
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS-ON
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	NC	18	-5V
9	5V STB	19	+5V
10	+12V	20	+5V

A.4 PCA-6114P10: 3 ISA / 10 PCI / 1 PICMG-slot Backplane

Dimensions: 300 x 323 mm



Unit: mm

1. CONNECTORS

CONNECTOR	Description
SLT1 ~ 2	PCIMG connectors
SLT3 ~ 4	16 BIT ISA BUS connectors
PCI 1 ~ 3	32 BIT PCI BUS connectors (primary)
PCI 4 ~ 10	32 BIT PCI BUS connectors (secondary)
CN1	12 Pin power (+ / -5V , + / -12V),SP,HDD,K/B,reset and PF Connector
CN2	8 Pin power (+ / - 5V , + / - 12V) , SP , HDD and PF Connector
ATX	To ATX power connector
J1 (KB - OUT)	To front part K/B connector
J2 (K/B - IN)	To CPU CARD K/B connector
J3	External K/B connector
J4	To CPU CARD fot ATX power connector
JP1	V - IO for secondary PCI Bus
JP2	Power ON control fot ATX power supply
P3	2 - PIN +5V DC power connector
P4 ~ 5	3 - PIN +5V and +12v DC power connector
P8 / P9	TO PS / 2 power connector
P11	6 - PIN +3.3V DC power connectors

JP2	
closed	ATX power supply power ON
open	ATX power supply power OFF

JP1		
	1-3,2-4 CLOSED	V_IO = +3.3V for sceondary PCI Bus
✳	3-5,4-6 CLOSED	V_IO = +5V for sceondary PCI Bus

Default : ✳

2. PIN ASSIGNMENTS

CN1	
PIN	NAME
1	+12V
2	-12V
3	SP
4	+5V
5	KBDLOCK
6	KBDDATA
7	KBDCLK
8	-5V
9	GND
10	RESET
11	HDD
12	+3.3V

CN2	
PIN	NAME
1	SP
2	+5V
3	KBDLOCK
4	GND
5	GND
6	RESET
7	HDD
8	NC

P4 ~ P5	
PIN	NAME
1	+5V
2	GND
3	+12V

P8/P9	
PIN	NAME
1	NC
2	+5V
3	+12V
4	-12V
5	GND
6	GND
7	GND
8	GND
9	-5V
10	+5V
11	+5V
12	+5V

P11	
1	+3.3V
2	+3.3V
3	+3.3V
4	GND
5	GND
6	GND

P3	
PIN	NAME
1	+5V
2	GND

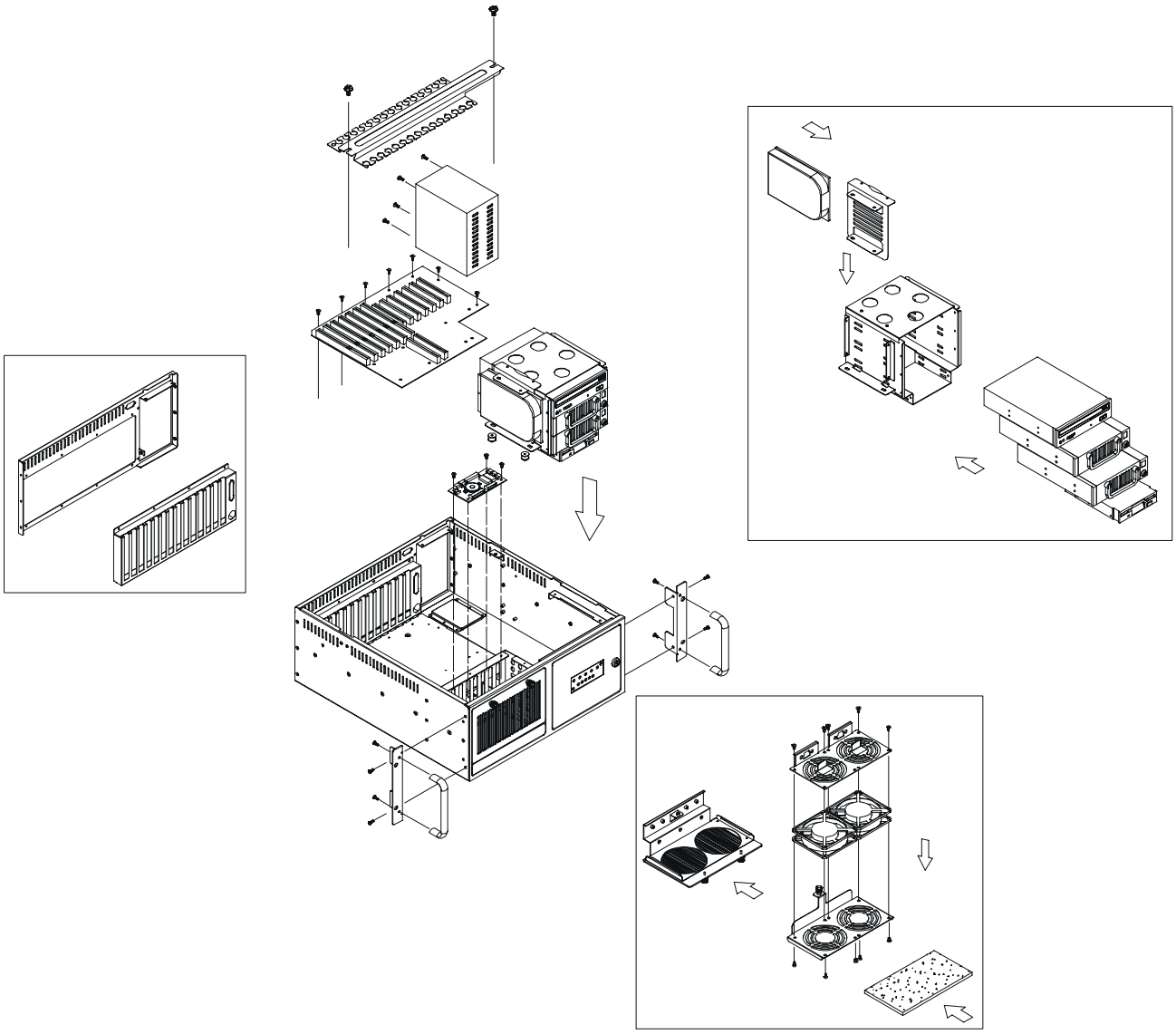
J1 ~ J3	
PIN	NAME
1	CLK
2	DATA
3	NC
4	GND
5	+ 5V

J4	
PIN	NAME
1	5V STB
2	GND
3	PS-ON

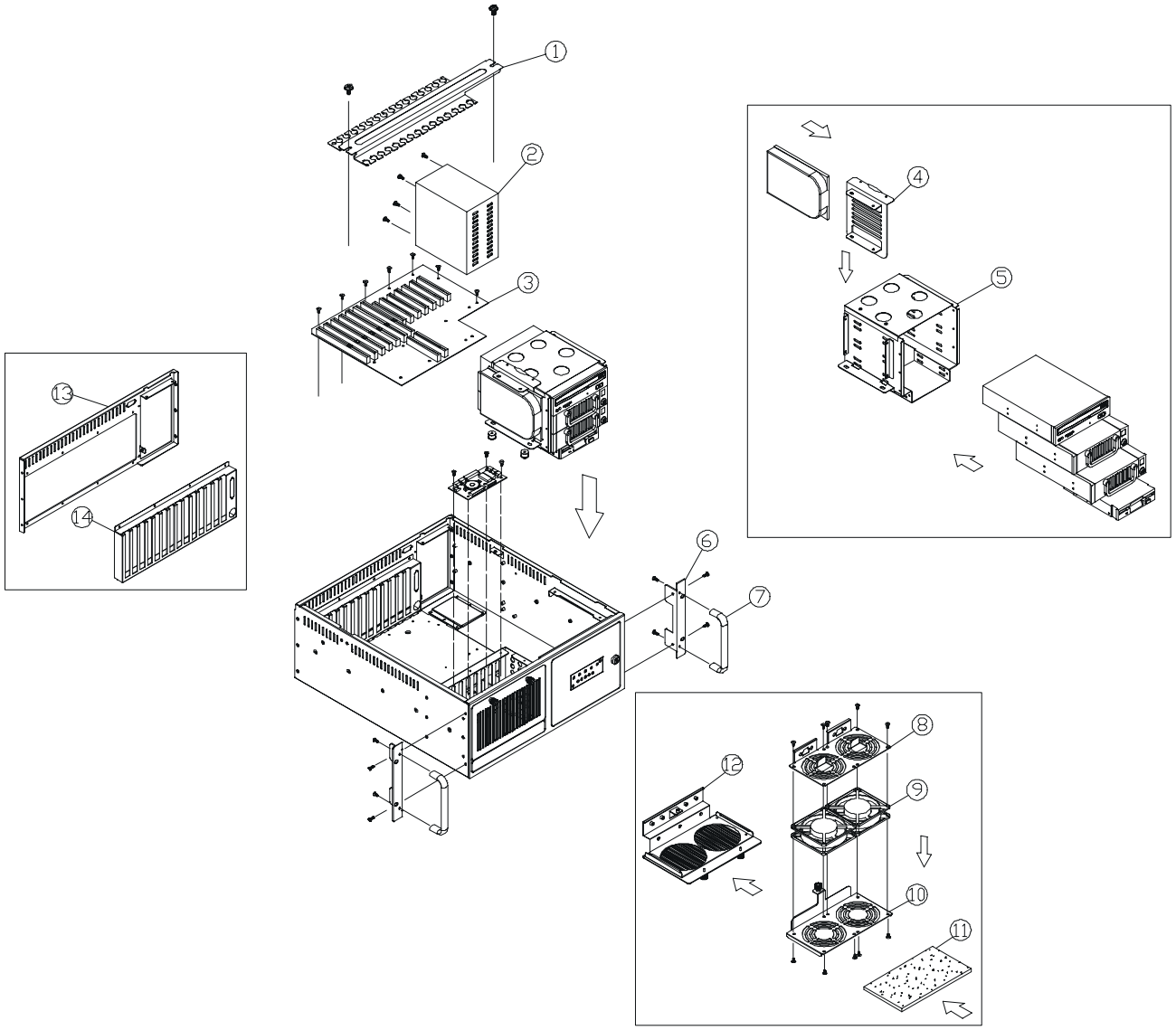
ATX			
PIN	NAME	PIN	NAME
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS-ON
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	NC	18	-5V
9	5V STB	19	+5V
10	+12V	20	+5V

Appendix B Exploded Diagram and Parts Ordering Guide

B.1 Exploded Diagram



B.2 Parts Ordering Guide



Ref	Part No.	Description	Ref	Part No.	Description
1	1962616330	HOLD DOWN CLAMP	8	1962616430	FAN HOLDING BRACKET
2	1757230004	300 W ATX PS	9	1759200230	FAN MODULE
3	9692611442	BACKPLANE	10	1962616380	FAN BRACKET
4	1962616340	HDD BRACKET	11	1999616010	FAN FILTER
5	1962616310	DRIVE BAY	12	1962616250	FILTER COVER
6	1962616390	MOUNTING BRACKET	13	1962616280	REAR COVER
7	1961000380	HANDLE	14	1962616320	I/O BRACKET

Appendix C Safety Instructions

C.1 English

1. Read these safety instructions carefully.
2. Keep this installation reference guide for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
12. Never pour any liquid into an opening. This could cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If any of the following situations arises, get the equipment checked by service personnel:
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.
    d. The equipment does not work well, or you cannot get it to work according to the installation reference guide.
    e. The equipment has been dropped and damaged.
    f. The equipment has obvious signs of breakage.
15. DO NOT LEAVE THIS EQUIPMENT IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS MAY DAMAGE THE EQUIPMENT.

The sound pressure level at the operator's position according to IEC 704-1:1982 is equal to or less than 70 dB(A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

C.2 German - Wichtige Sicherheishinweise

1. Bitte lesen sie Sich diese Hinweise sorgfältig durch.
2. Heben Sie diese Anleitung für den späteren Gebrauch auf.
3. Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie Keine Flüssig-oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.
4. Die Netzanschlußsteckdose soll nahe dem Gerät angebracht und leicht zugänglich sein.
5. Das Gerät ist vor Feuchtigkeit zu schützen.
6. Bei der Aufstellung des Gerätes ist auf sicheren Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen.
7. Die Belüftungsöffnungen dienen zur Luftzirkulation die das Gerät vor überhitzung schützt. Sorgen Sie dafür, daß diese Öffnungen nicht abgedeckt werden.
8. Beachten Sie beim Anschluß an das Stromnetz die Anschlußwerte.
9. Verlegen Sie die Netzanschlußleitung so, daß niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.
10. Alle Hinweise und Warnungen die sich am Geräten befinden sind zu beachten.
11. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.
12. Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. elektrischen Schlag auslösen.
13. Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von authorisiertem Servicepersonal geöffnet werden.
14. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:
    a. Netzkabel oder Netzstecker sind beschädigt.
    b. Flüssigkeit ist in das Gerät eingedrungen.
    c. Das Gerät war Feuchtigkeit ausgesetzt.
    d. Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.
    e. Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.
    f. Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.
15. Bitte lassen Sie das Gerät nicht unbehehrt hinten unter -20° C (-4° F) oder oben 60° C (140° F), weil diesen Temperaturen das Gerät zerstören könten.

Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70dB(A) oder weiger.

DISCLAIMER: This set of instructions is provided according to IEC704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.